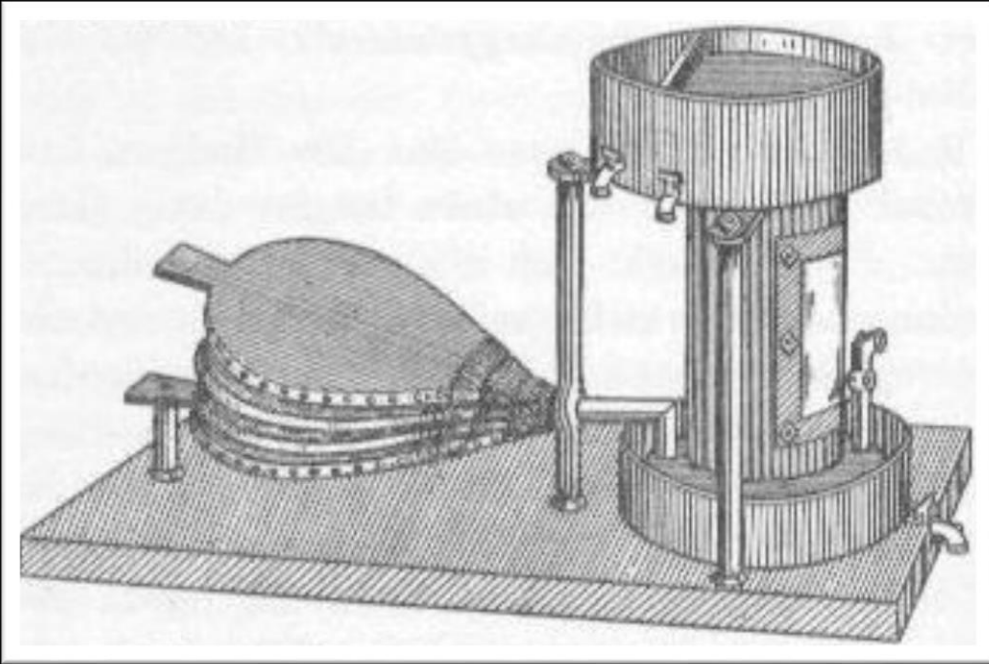
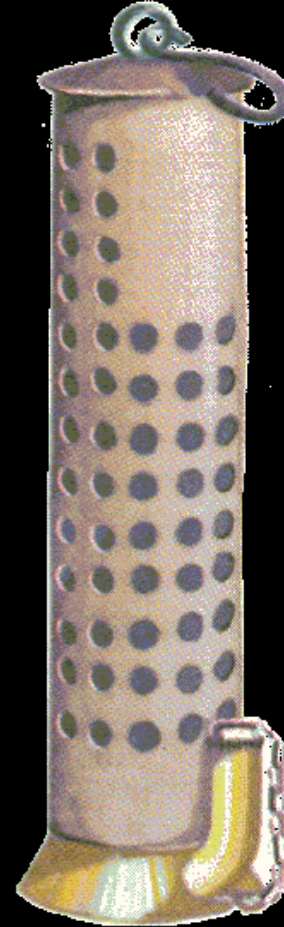


68ª Sessão da Assembleia Geral das Nações Unidas proclamou o ano de 2015 como o Ano Internacional da Luz e das Tecnologias baseadas em Luz

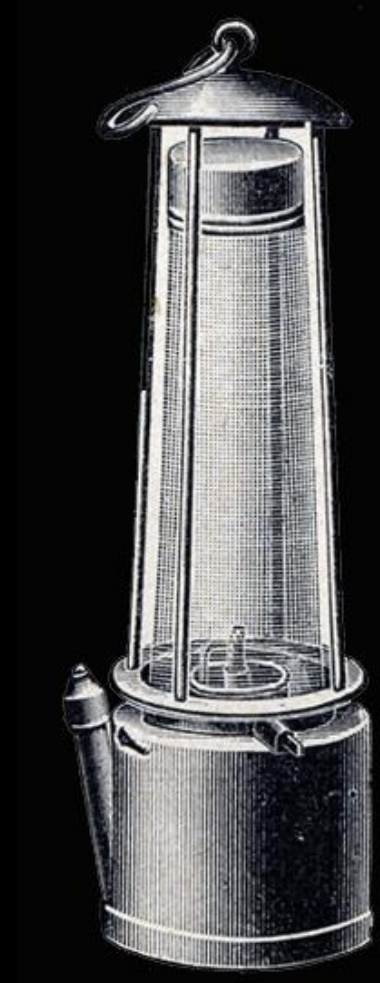
Luz na Mina Nos 200 anos das Safety Lamps



Clanny



Geordie



Davy



Alexandre Leite
aleite@fe.up.pt

... A procissão de mineiros desaparece nas bocas da terra.

O clarão do amanhecer hesita à entrada, ainda acompanha os mineiros até ao primeiro quadro, mas já aí as trevas húmidas se preparam para o devorar.

Os olhos dilatam-se para se adaptarem ao halo desmaiado do carboneto...

... Os mineiros dividem-se pelas galerias transversais, pelos poços, e os últimos continuam a marcha até aos desmontes..."

In "Minas de San Francisco" de Fernando Namora 1981

Cerca de um milhão de Lucernas descobertas em 1994, na
localidade de Santa Bárbara dos Padrões – Castro Verde



Lucernas de Santa Bárbara

M. García Pereira Maia, M. Maia
Castro Verde 1997



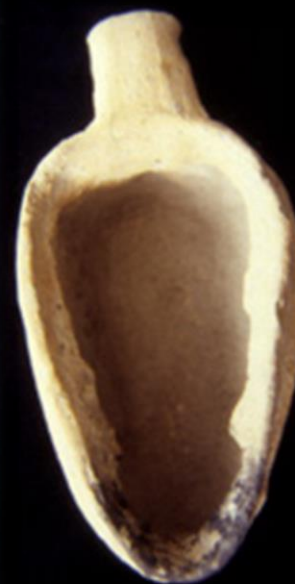
Mitra ~ deus persa



Castro Verde

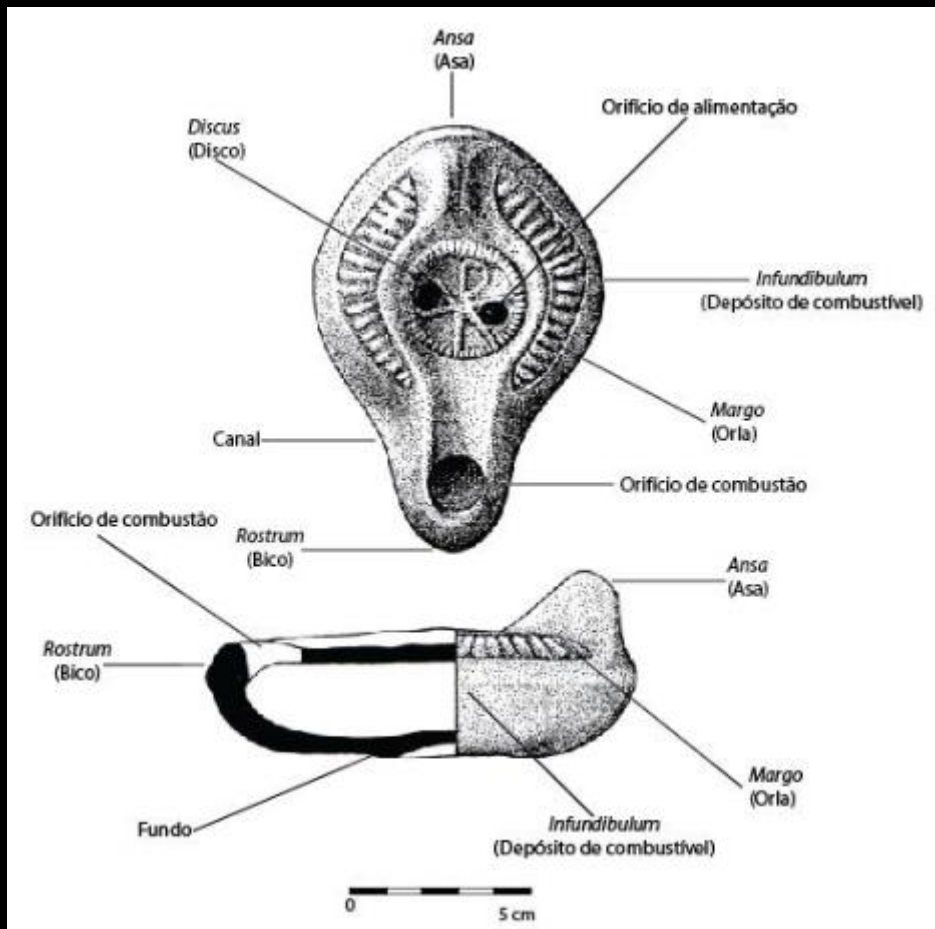


Minas de Sal de Hallstatt ~ Austria
+ 1500 AC



Lucernas





https://estudogeral.sib.uc.pt/bitstream/10316/19172/1/Tese_Iiliana%20Serrano.pdf



Lucernas Mineiras Romanas

- Fojo das Pombas - Valongo

- Complexo Mineiro do Braçal e Malhada





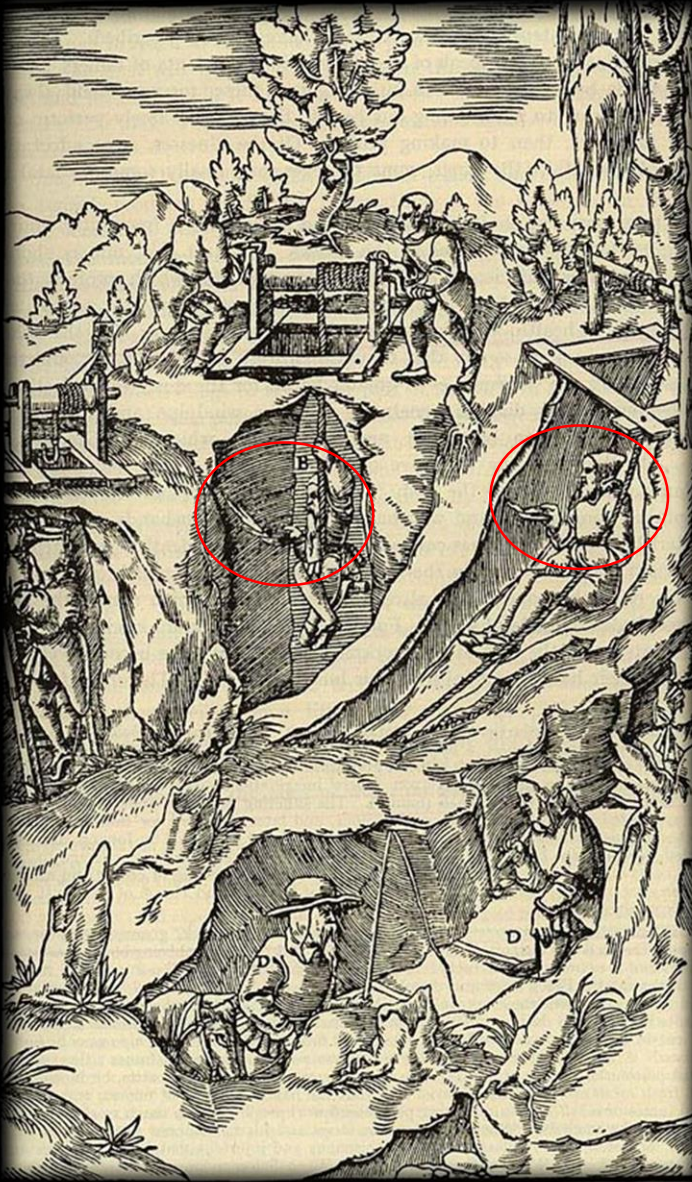
Segóbriga (Séc. I a.c.)



Gesso ~ Lapis Specularis



"De re metallica" ~ Georgius Agricola - 1556



Georgius Agricola

Crusie Lamp

"... they cannot breathe freely and they have headaches; this more often happens if they work in these places in great numbers, and bring many lamps, which then supply them with a feeble light, because the foul air from both lamps and men make the vapours still more heavy."



Sicilian Tunnel Lamp
Lenticular Lamp
Áustria



Betty Lamp
Alemanha
Áustria
Hungria



Frog Lamp
Alemanha



Giesser Lamp
Alemanha



Wells' Lamp
Peru



Blend Lamp – Freiberge – Saxon Silver Mines

9





Carlisle Spedding

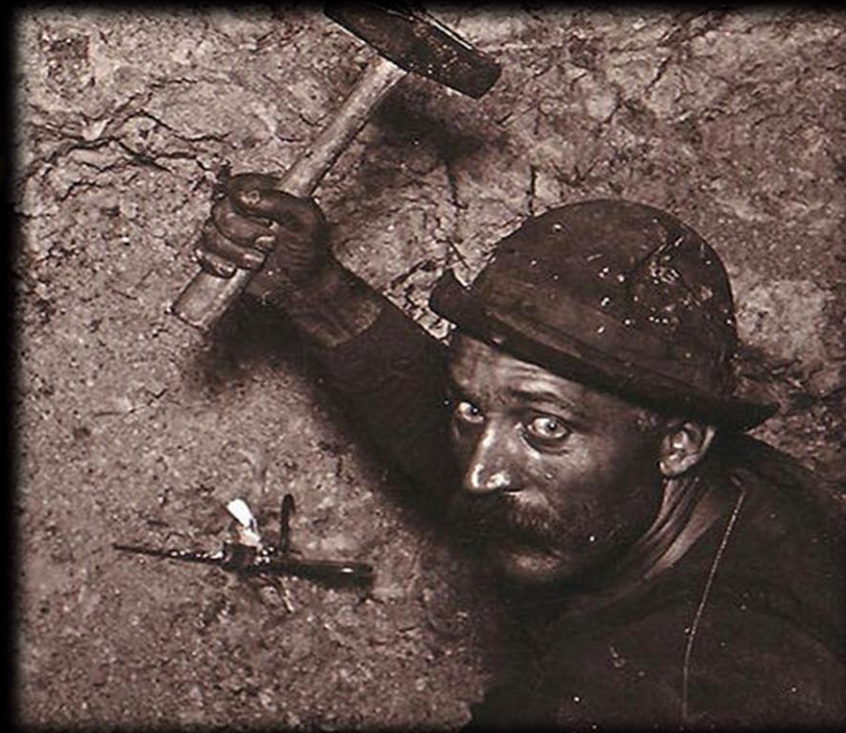
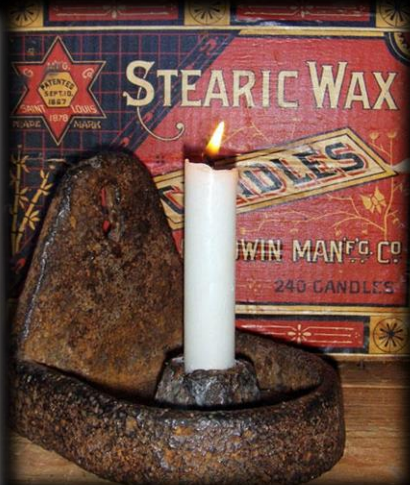


Spedding Mill



Séc XVIII – Velas de sebo de Ovelha

1850 – Parafina – C_nH_{2n+2}



Candlestick



.../... 1500 1600 1700 1800 1810 1815 1820 1830 1840 1850 1860 1870 1880 1890 1900 1910 1920 1930 1940 1950 1960 1970 1980 1990 2000 2010 2020



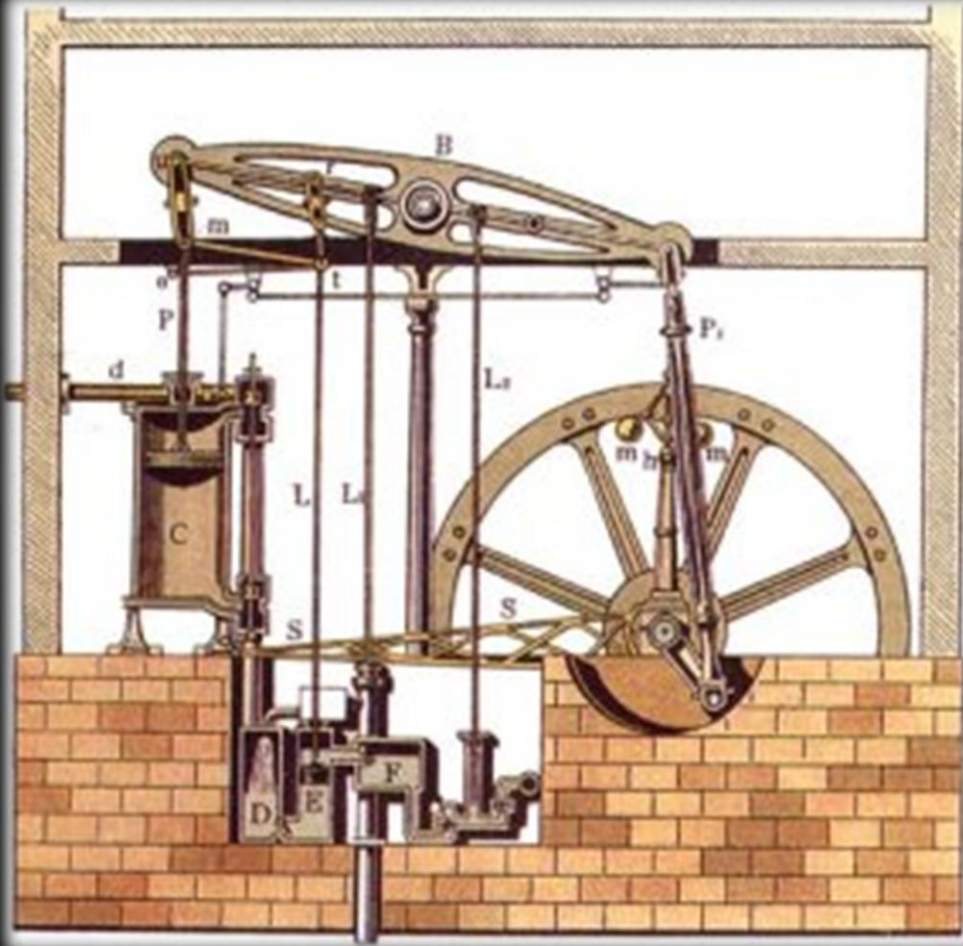
1880 - Mineiros de Comstock - Nevada - Utah - US



Comstock Mine Lantern



1769 ~ James Watt ~ Melhoramentos na Máquina a Vapor Newcomen ~ Máquina a Carvão



James Watt

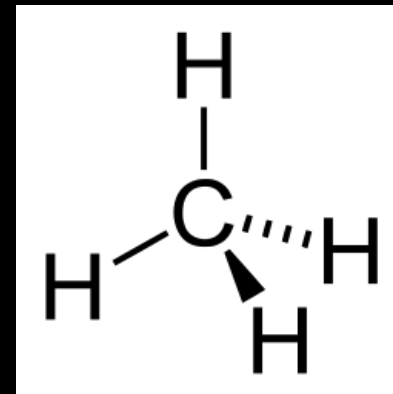


Revolução Industrial ~ Prolíferam a minas de carvão.
A paisagem muda!





Metano - CH_4

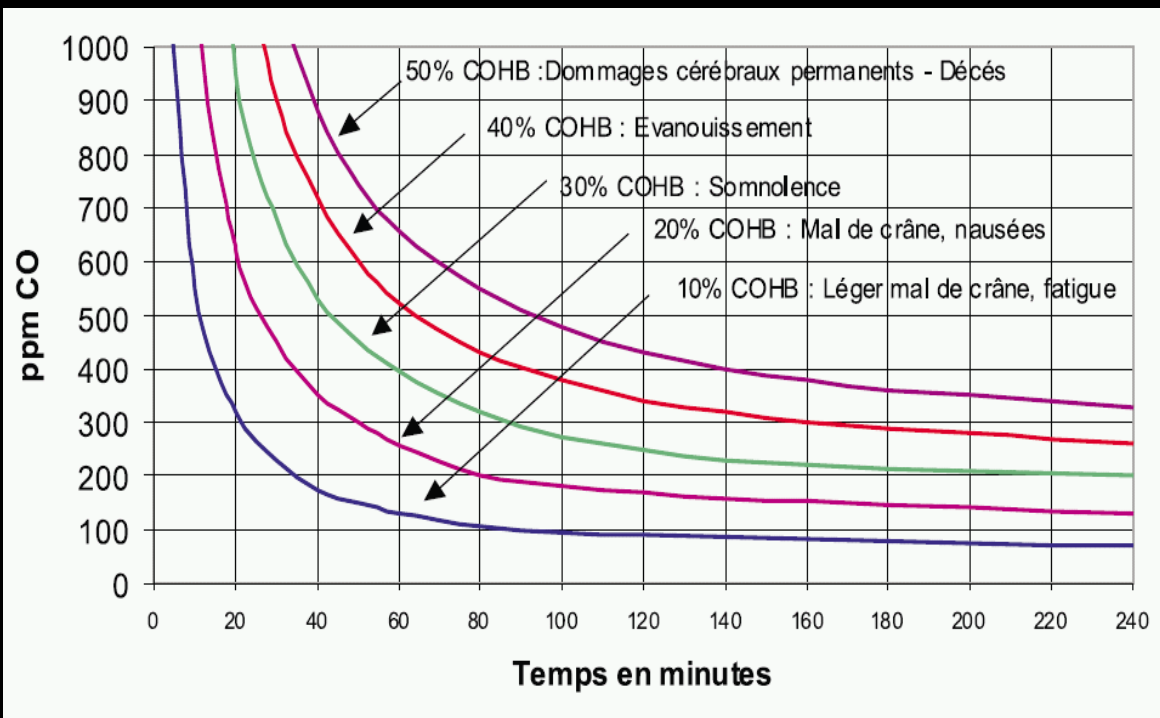


Grisú - Mistura de metano com oxigénio - Explosiva

Pó e carvão - inflamável

Monóxido de Carbono - CO - Gás venenoso





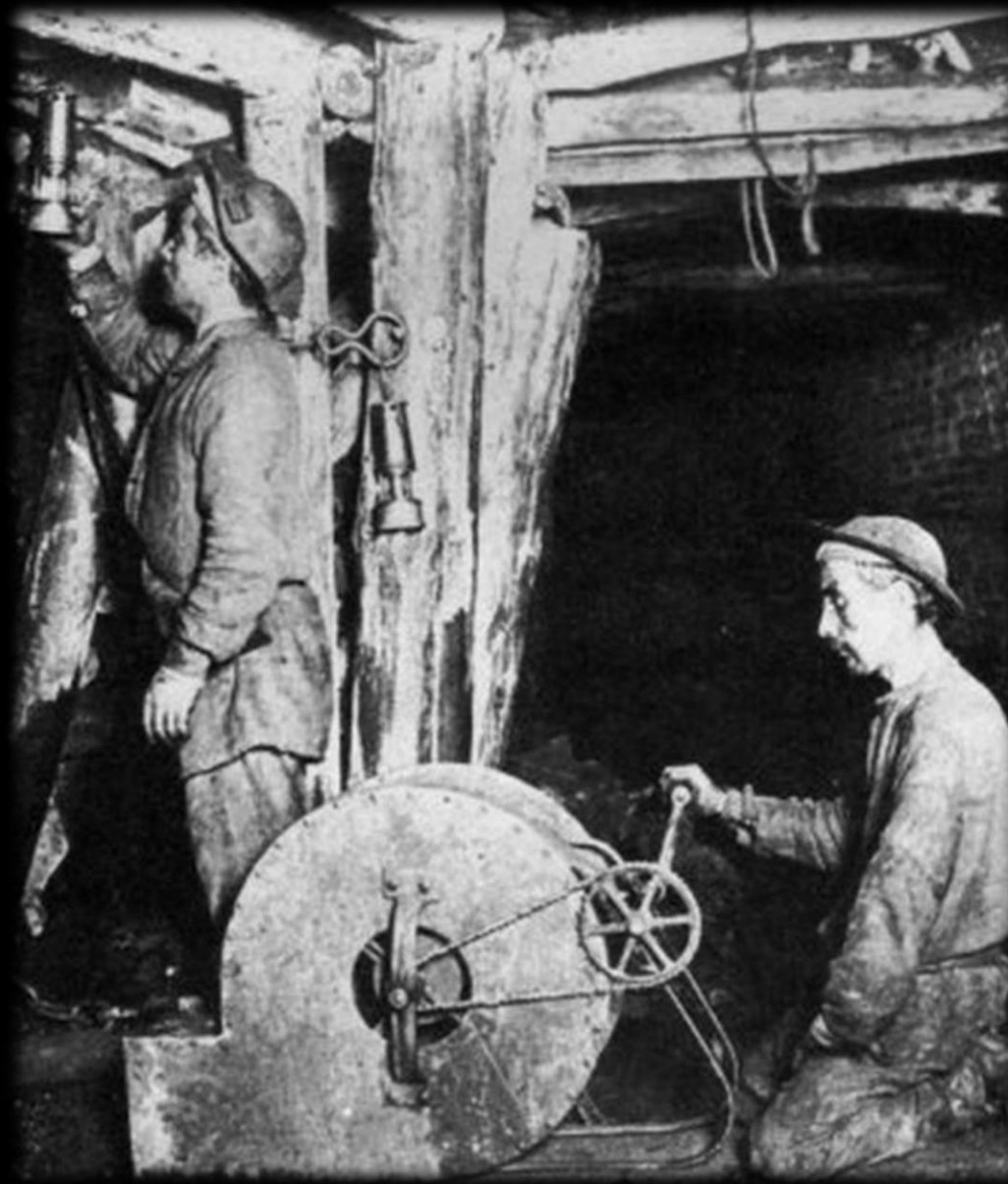
Ditado popular inglês:
"I'm a Canary in the coal mine"



Sistema de bloqueio da propagação de incêndios



Sprinkler



Ventilador



“O Penitente”

Pit disaster

200TH ANNIVERSARY OF FELLING PIT TRAGEDY

Two hundred years ago on 25 May 1812 at 11.30am 92 men and boys, died in an explosion at John Pit in Felling. This was a major mining tragedy in the community and a disaster of great historical importance, which brought about the design of a number of safety lamps.

To mark this event, the Felling Activity Project Group – led by community members – is planning a range of events and activities that will culminate in a two day event on May 25 and 26. They have been working extremely hard over recent months with support from Gateshead Council, Beamish, Tyne & Wear Archives & Museums, Reverend Davidson of Christ Church, Brandling Primary school and other local schools in the area.

Money from the Heritage Lottery Fund will be used to make commemorative banners, which will be paraded at the event, a

'then and now' exhibition, and a disaster glass which will be on display at Christ Church. Local people will also work with local firm AkzoNobel, who have provided funding and paint to create a historical mural for the commemorative weekend.

On 25 May the Mayor of Gateshead will be unveiling two blue plaques to commemorate the disaster at St. Mary's Church, Heworth and near the actual pit site at Mulberry Street.

The pit finally closed in March 1931. A memorial obelisk, commemorating those who died in the 1812 disaster, currently stands near the west gate of Heworth churchyard.

Felling Activity Group would like to hear from anyone who has any links with the pit – did a member



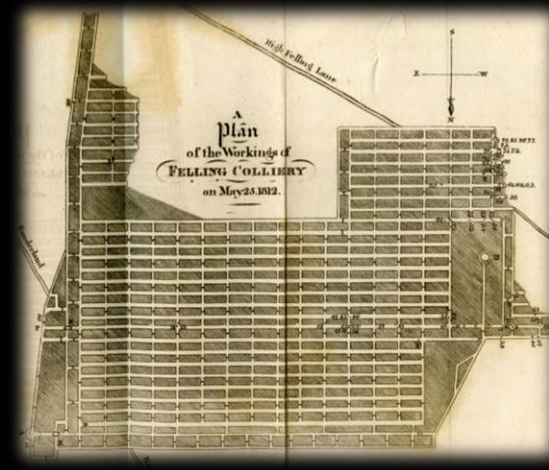
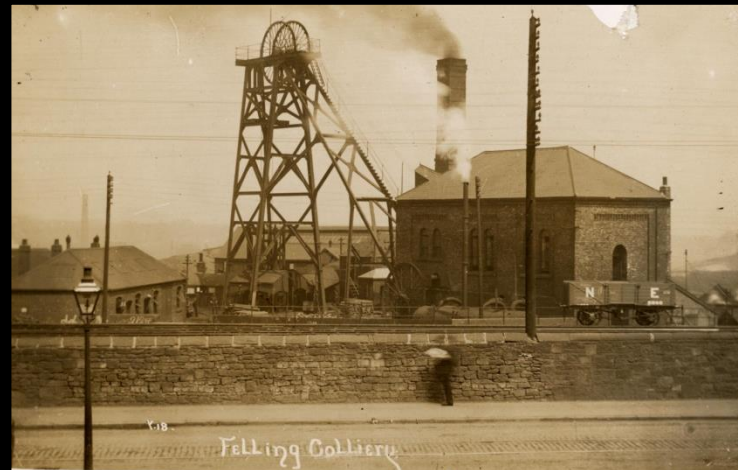
Miners at John Pit, Felling c.1890s

of your family work there? Do you have any photographs or mining memorabilia linked with the pit or can you trace a family connection back to the disaster?

If you have or would like to be involved in the group's activities, please contact Reverend Trevor Davidson by email:
revtrev@blueyonder.co.uk



1812 ~ maio 18



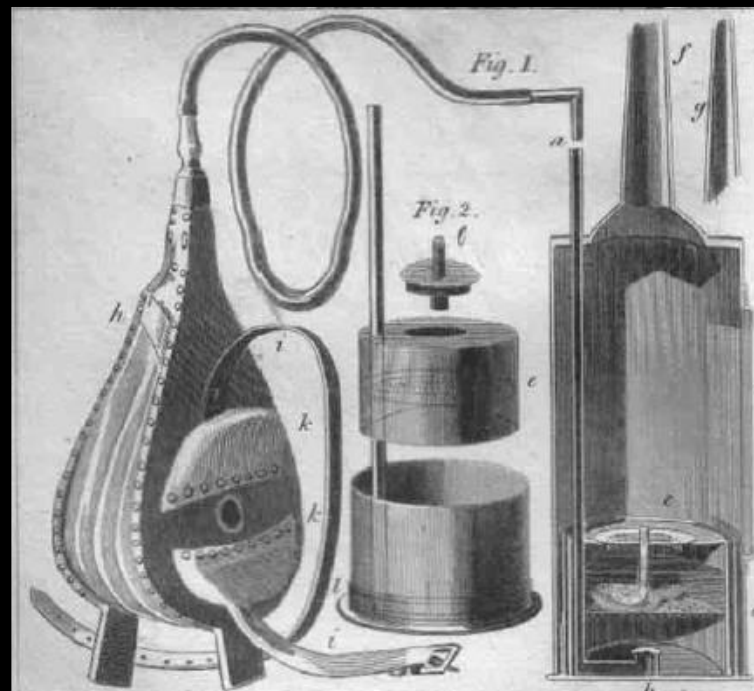
1811 – Dr. William Reid Clanny – Irlanda – Ensaios para a criação de uma lanterna de segurança.

Em maio de 1813 – Apresenta à *Royal Philosophical Society* de Londres, um documento com o título: “*On the means of procuring a steady light in coal mines without danger of explosion.*”

1 de outubro de 1813 – Exibe a sua lanterna na *Literary & Philosophical Society* de Newcastle e pouco tempo depois à *Sunderland Committee for Prevention of Accidents in Coal Mines*.

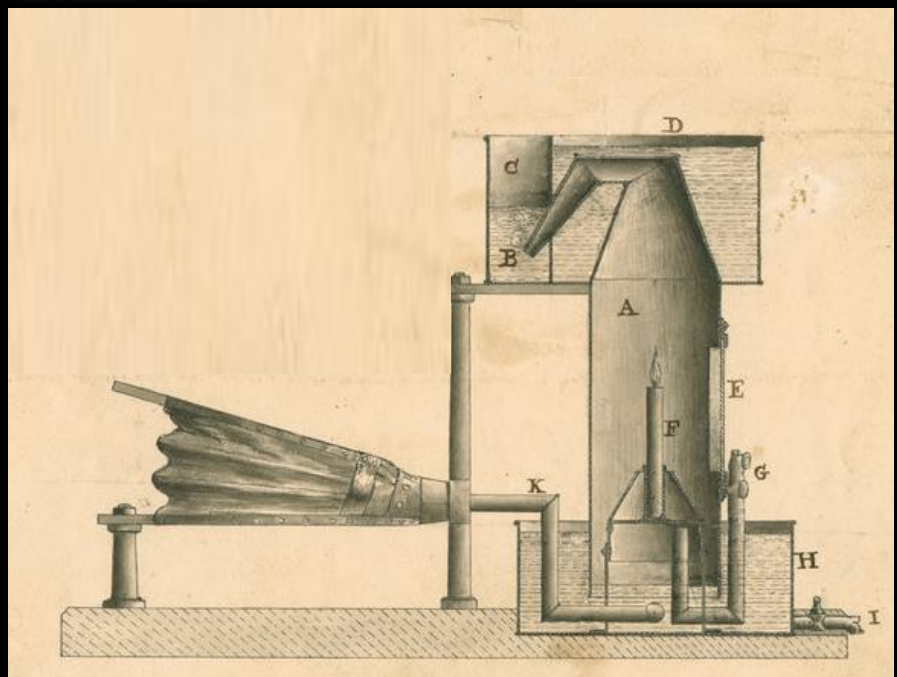
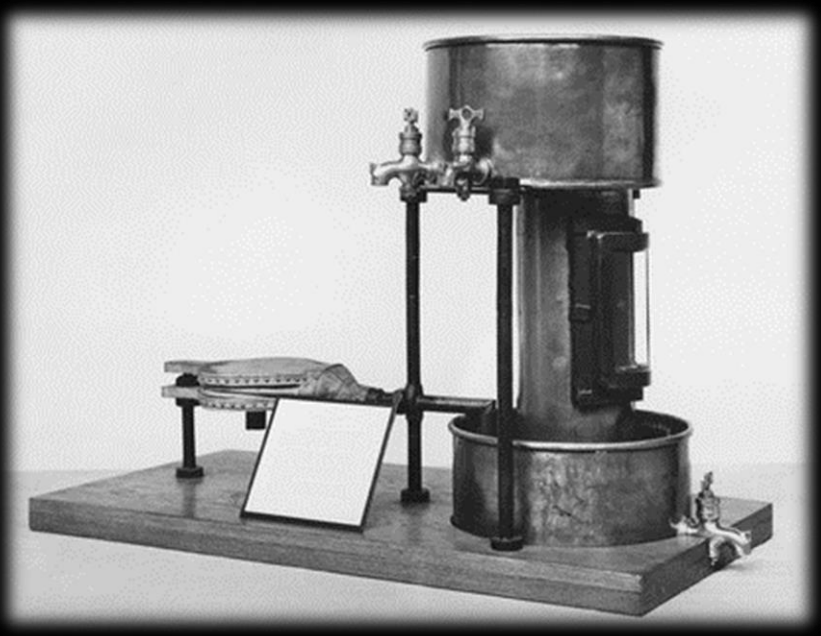


William Reid Clanny



16 de outubro de 1815 – A lanterna de Clanny é testada na *Harrington Mill Pit*.



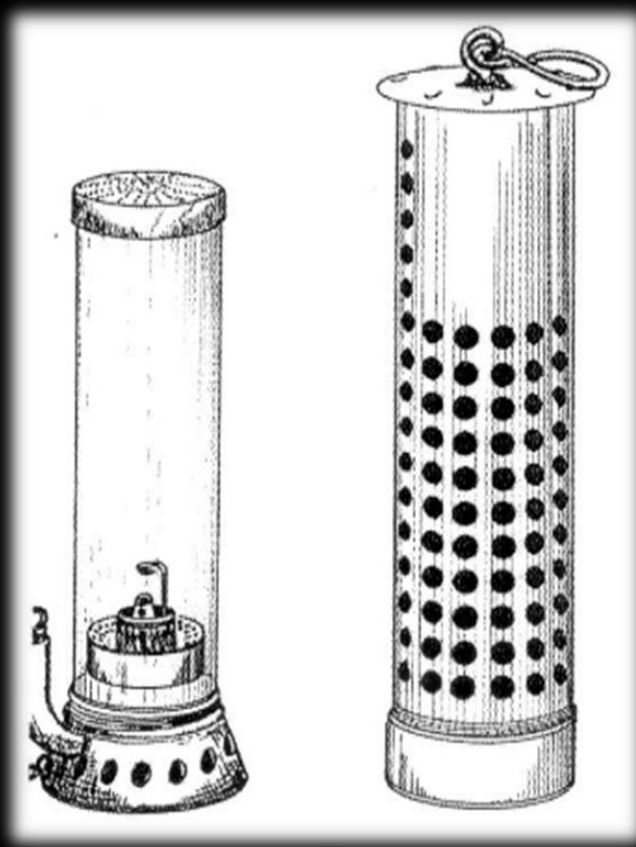


Em agosto de 1815, George Stephenson fez também os seus primeiros desenhos de uma lanterna de segurança para ser usada em minas de carvão.

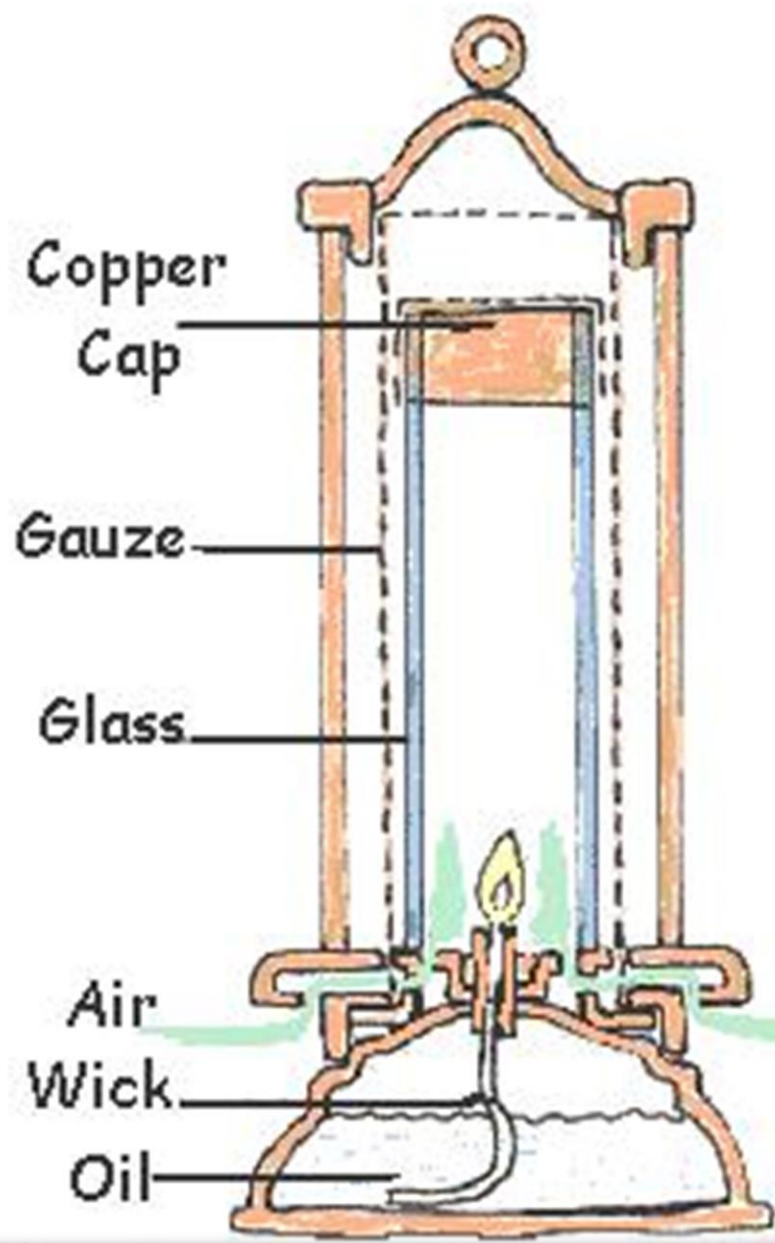
4 de novembro de 1815 ~ a lanterna de George Stephenson é testada na *Killingworth Colliery*, Northumberland.



Geordie Safety Lamp



George Stephenson

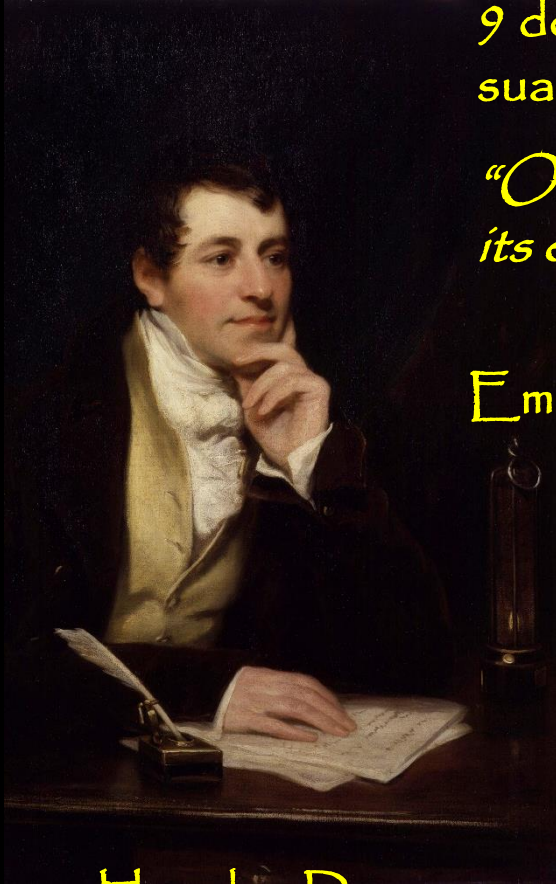


A 23 de agosto de 1815 Humphry Davy reuniu-se em Newcastle, a pedido do reverendo John Hodgson,²³ com membros da *Society for preventing accidents in Coal Mines*.

9 de novembro de 1815 Humphry Davy apresentou na *Royal Society* de Londres, as suas descobertas sobre a condutividade térmica e sobre a propagação de chamas.

"On the firedamp of coal mines, and on methods of lighting the mines so as to prevent its explosion."

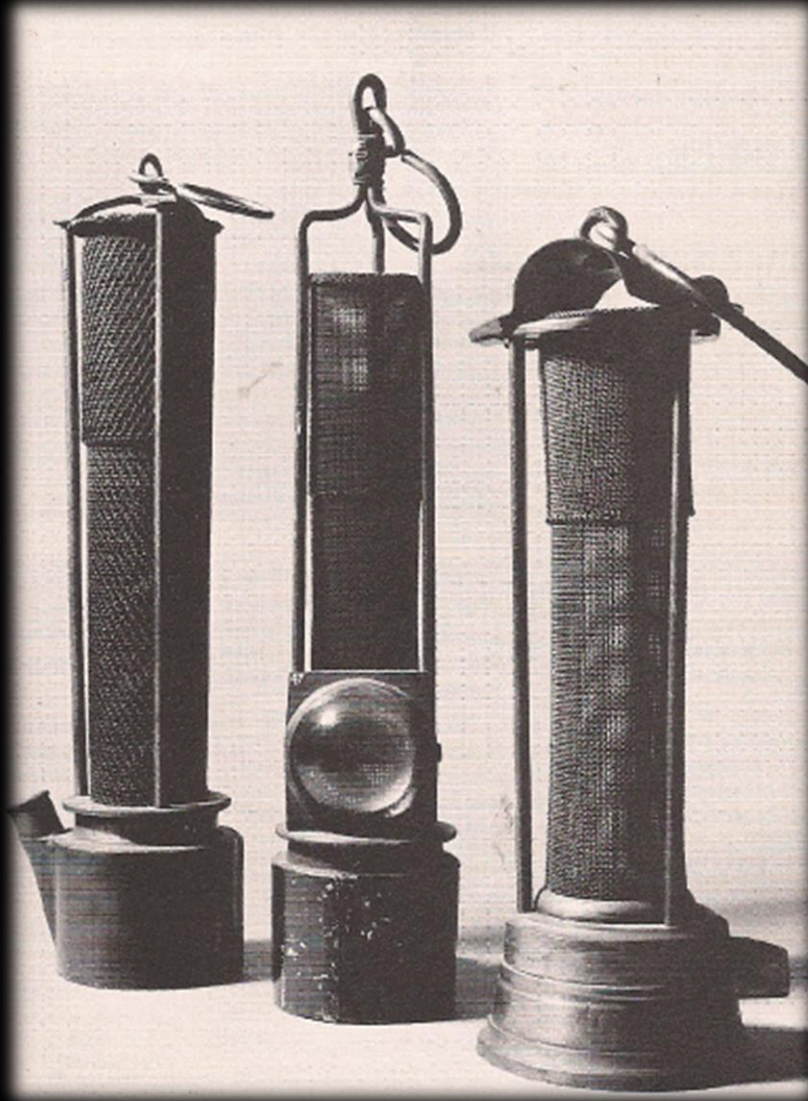
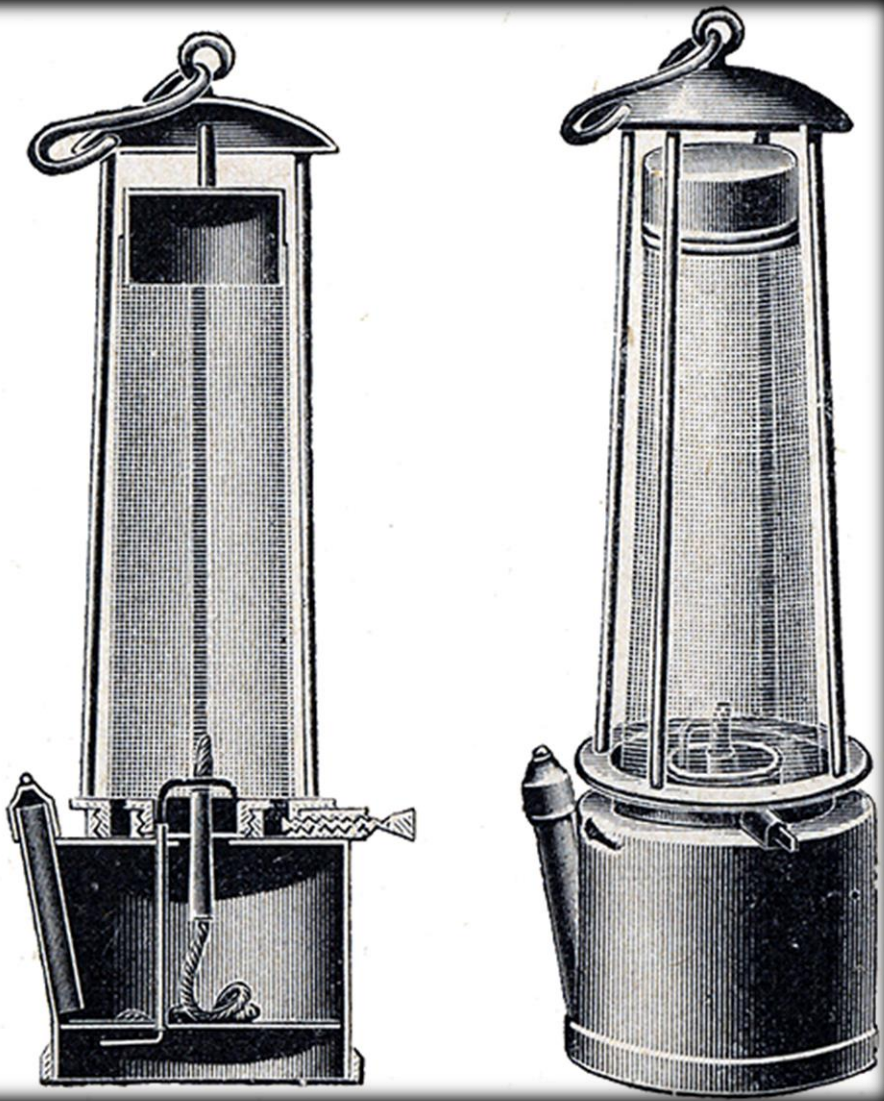
Em dezembro de 1815 surge a Davy Safety Lamp.



Humphry Davy

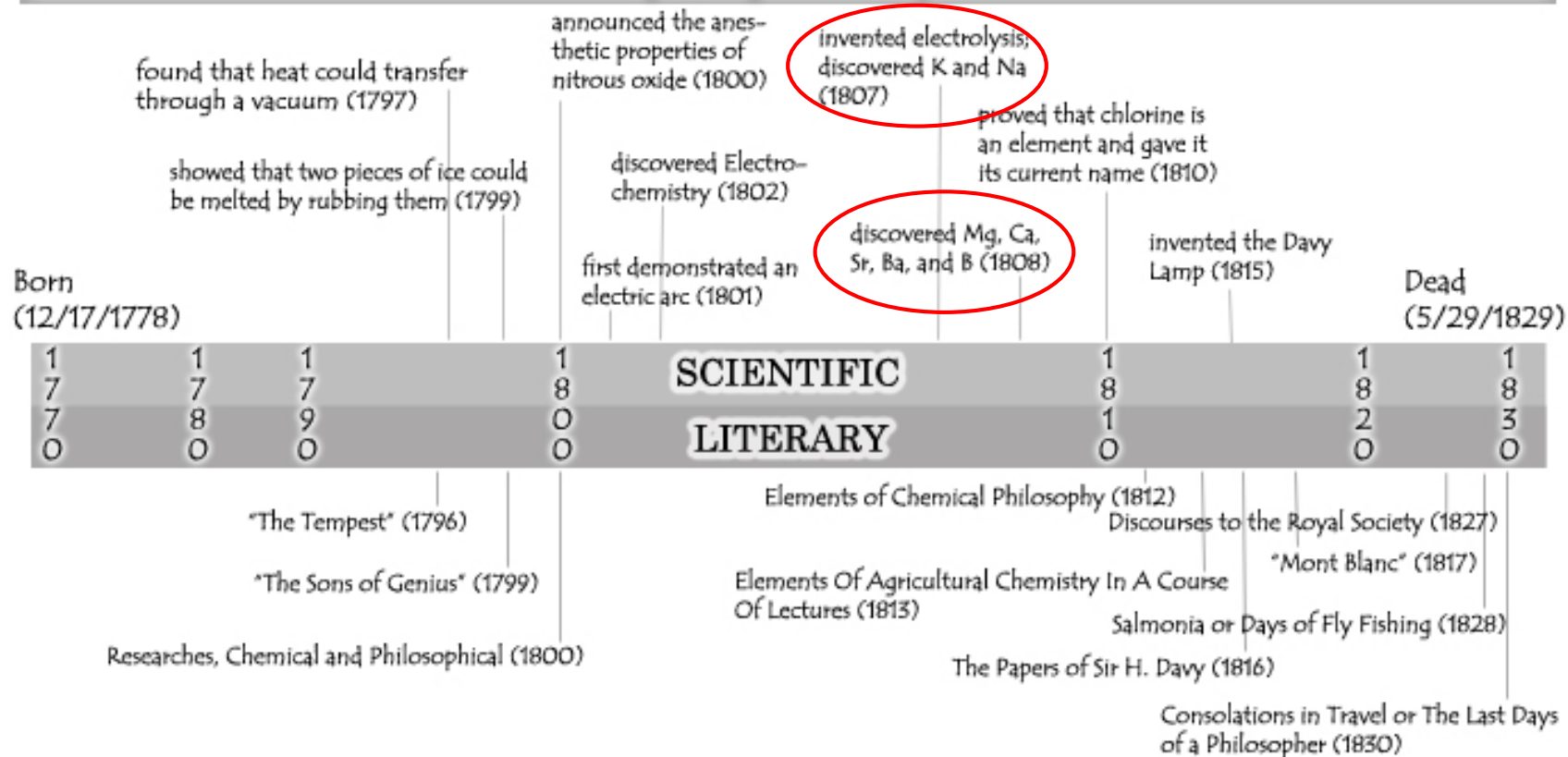


<http://www.postaprint.co.uk/ilnimages/G761376.jpg>



The Miner
1876

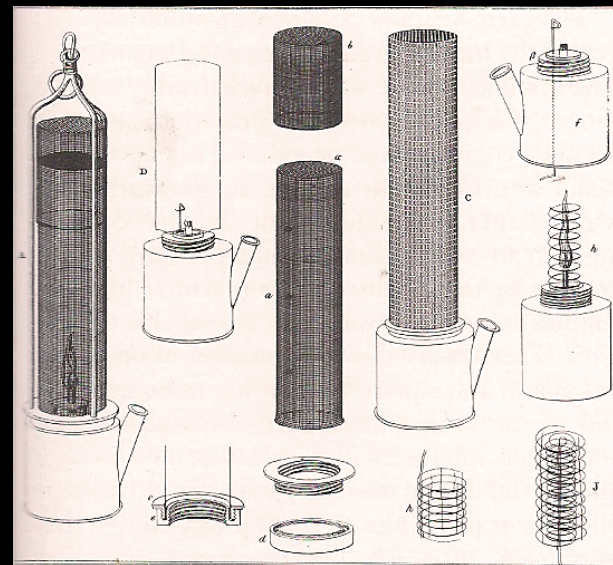
Timeline of Humphry Davy's Achievements

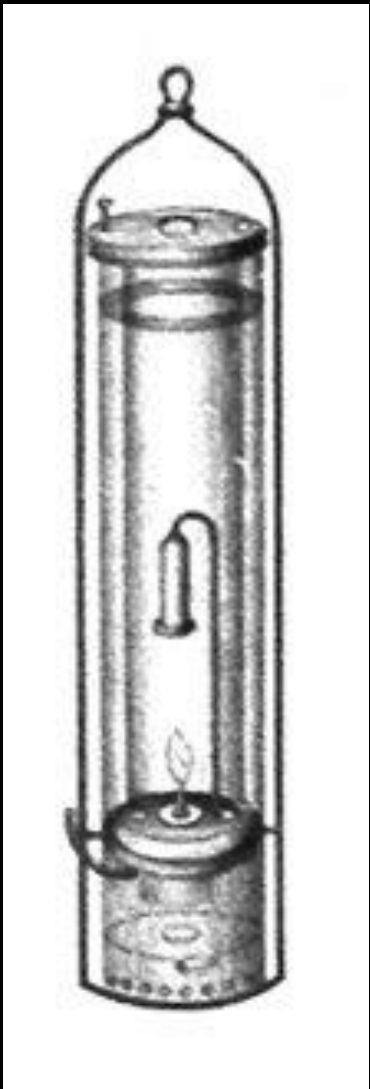


Timeline of Humphry Davy's scientific achievements and literary publications

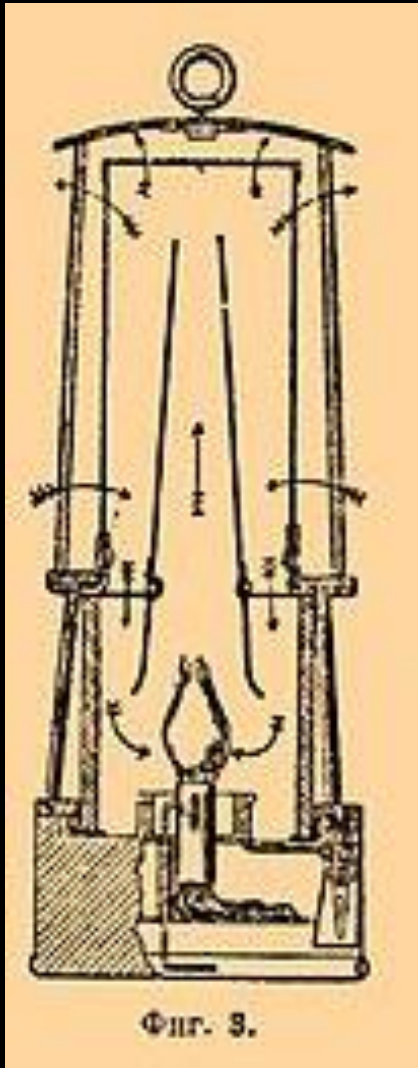


Humphry Davy





1821 ~ John
Murray



1840 ~ Museler



1843 ~ Boty



1846 ~ Elnoin



Twins lamp

A tall, cylindrical brass lantern. The body is covered in a woven mesh of brass strips. It has a handle on top and a glass lens at the bottom. The lantern is made of brass and has a woven mesh body. It has a handle on top and a glass lens at the bottom. The lantern is made of brass and has a woven mesh body. It has a handle on top and a glass lens at the bottom.

A tall, cylindrical metal lantern, likely made of brass or copper. It features a wide, flared base and a central body with horizontal slats or perforations. A large, curved handle is attached to the left side, and a small ring is visible at the top. The lantern is shown against a plain, light-colored background.

A tall, ornate brass lantern with a glass chimney and a decorative top. The lantern features a brass frame with four vertical support bars. The top has a decorative cap with a handle and ventilation holes. The base is also decorated with horizontal bands. The word "JENNISON" is visible on the base.





Lampistería





The Miners Lamps of John Davis & Son



A Miners Lamp Society Publication





1883 ~ F. Pieler



1900 ~ Mulkay Pieler



1900 ~ Cosset-Dubrelle

<http://www.eurekamagazine.net/EUREKA+8.pdf>

[Introduction](#)[Les catastrophes minières](#)[Lexique](#)[Documents](#)[Images commentées](#)[A propos](#)[Plan](#)

1871 et 1876 : Les martyrs du puits Jabin

Le puits Jabin des Houillères de Saint-Étienne a été foncé entre 1832 et 1835. Il se situait rue de la Montat, sur le site de l'ancien siège social de Casino. Ce vieux puits, assis sur des couches très riches en charbon métallurgique a été modernisé dans les années 1860. Il a reçu notamment l'un des tout premiers [chevalements](#) métalliques français. Les travaux de Jabin étaient reliés à ceux du puits Saint-François, [puits](#) de retour d'air.

1876 – Le puits Jabin – Saint-Étienne

COMMISSION DU GRISOU

PRINCIPES A CONSULTER

DANS L'EXPLOITATION DES MINES A GRISOU (1).

Texte préparé par la Commission
pour être communiqué aux exploitants avant d'être adopté
par elle.

CATASTROPHE DU 4 FÉVRIER 1876

PUITS JABIN

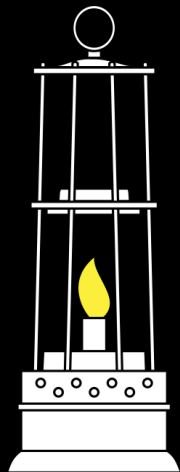
A SAINT-ÉTIENNE (Loire).

Explosion du feu grisou dans les galeries creusées
à 366 mètres de profondeur.

216 VICTIMES

1877
Commission
du Griso





1884 – Royal Commission, *'To inquire into accidents in mines, and the possible means of preventing their recurrence or limiting their disastrous consequences'*.

Foram testadas mais de 300 lanternas inglesas, belgas, francesas e alemãs.

Os testes decorreram no Woolwich Arsenal - Londres

Conclusão: não há lanternas seguras!



Evan Thomas nº 7 Lamp



Gray's Lamp

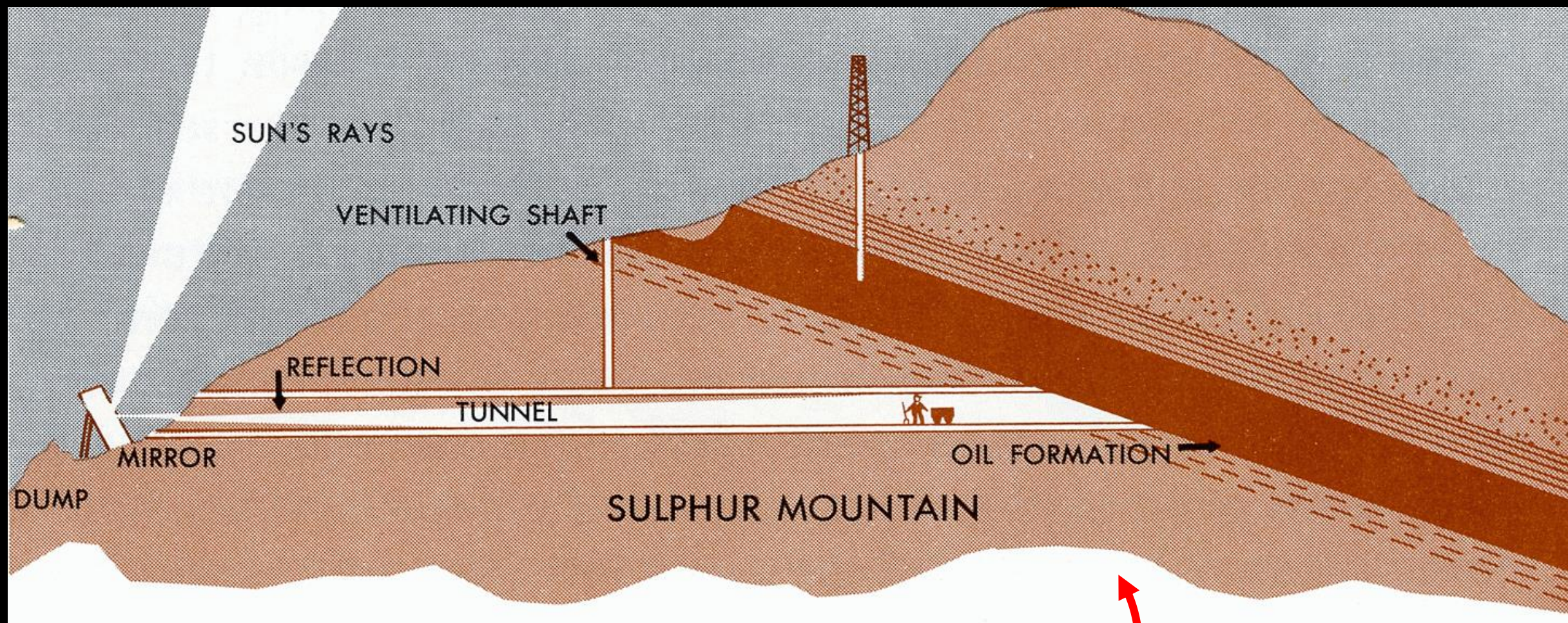


Marsuat Lamp



Meuseler Bonneted Lamp





1785 - Escócia

1890 - Sulphur Mountain - Santa Paula Oil field - California



1840 - Escócia - Oil Wick Mining Lamps

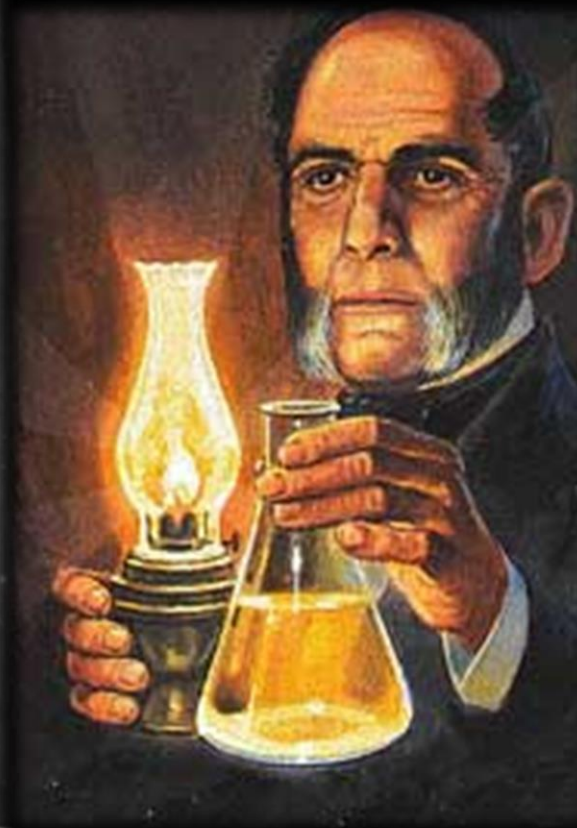
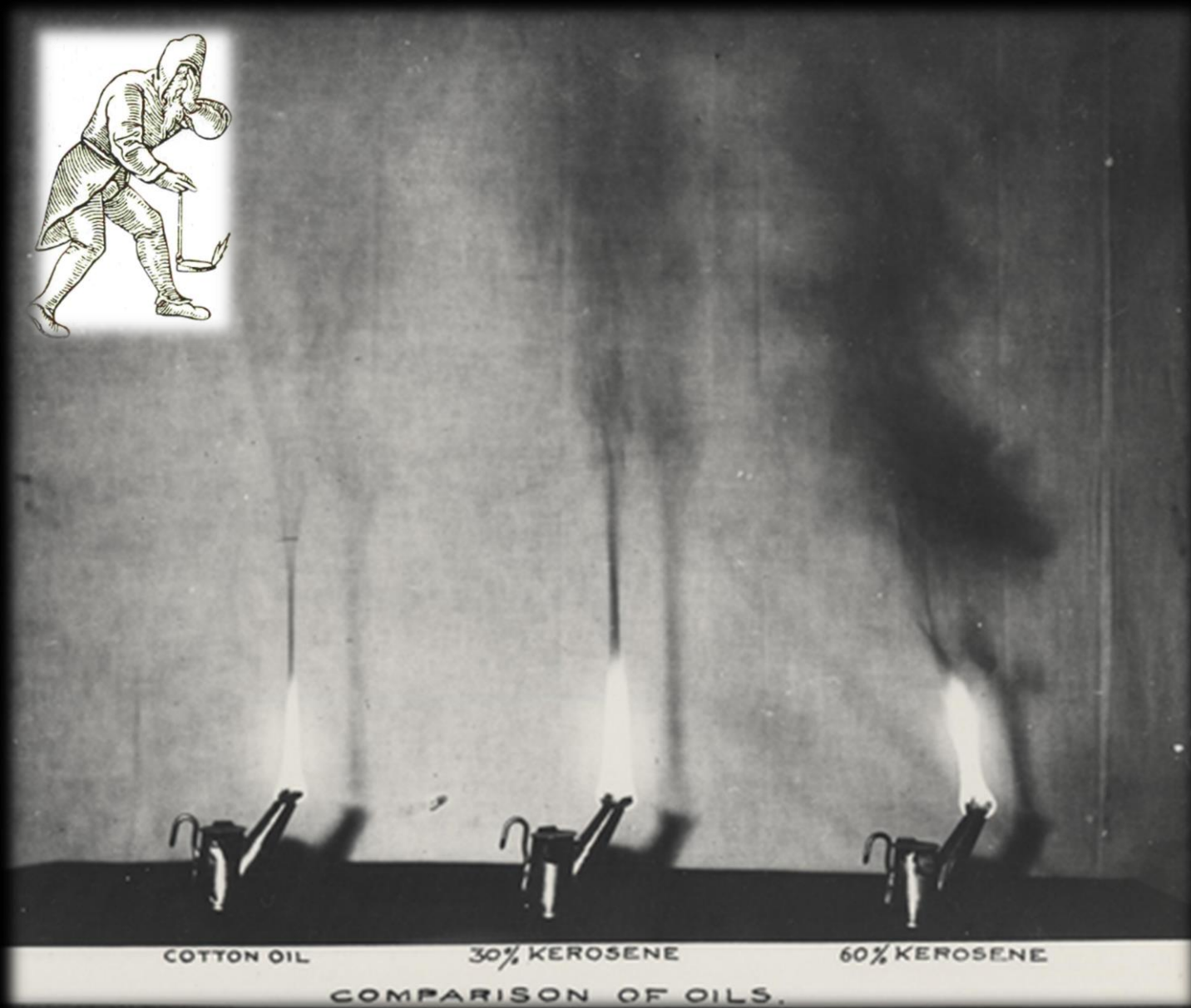
35



.../... 1500 1600 1700 1800 1810 1815 1820 1830 1840 1850 1860 1870 1880 1890 1900 1910 1920 1930 1940 1950 1960 1970 1980 1990 2000 2010 2020

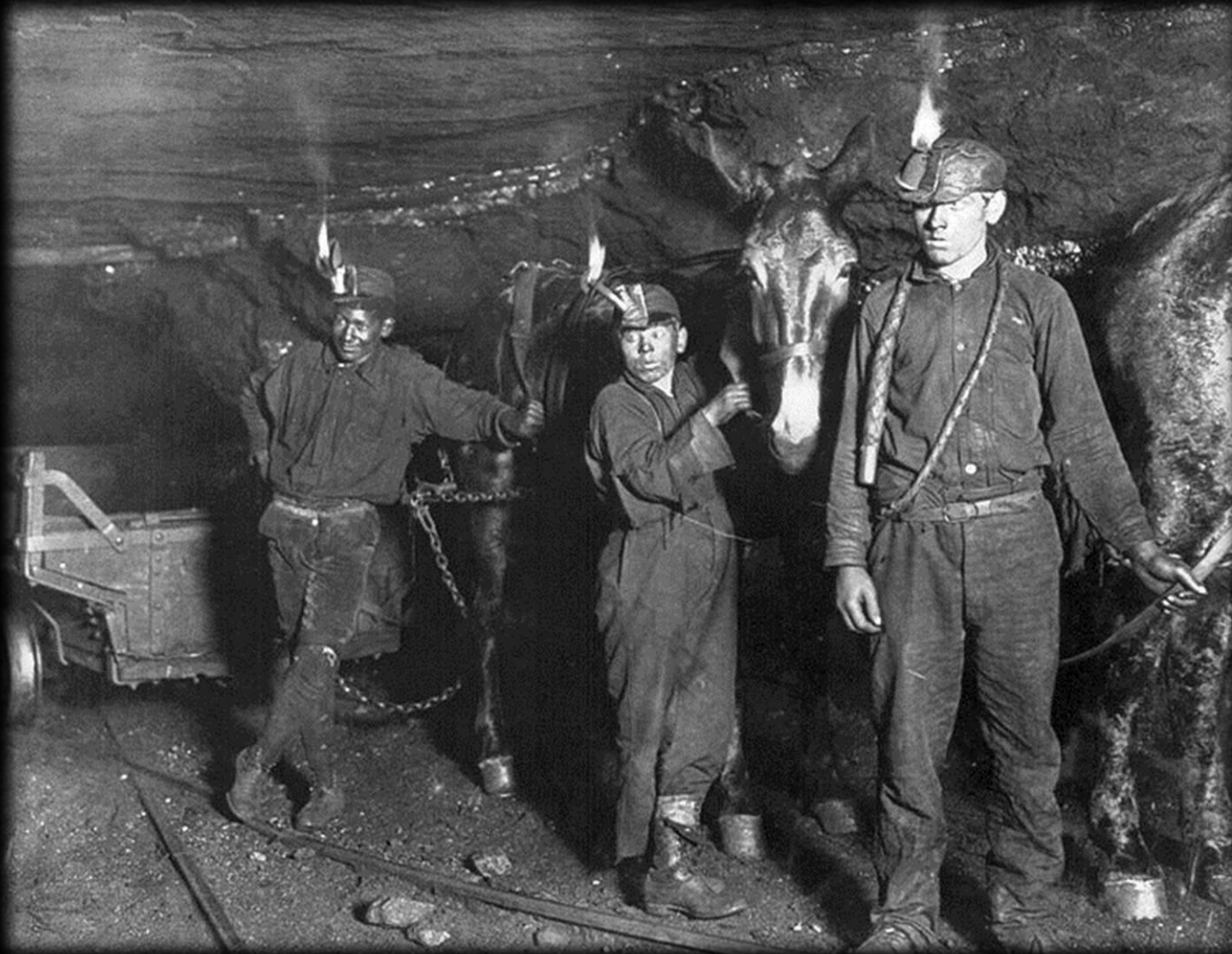


1846 – Abraham Gesner, geólogo canadiano, conhecido como o Pai do Petróleo, obtém querosene refinado a partir de uma substância asfáltica.



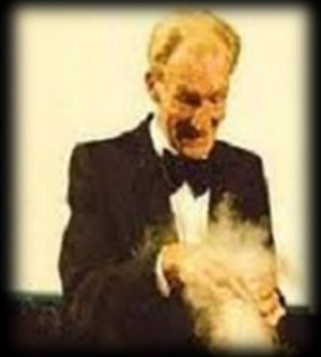
Abraham Gesner





1908 – Mina de Carvão Gary – West Virginia – USA





Edmund Davy

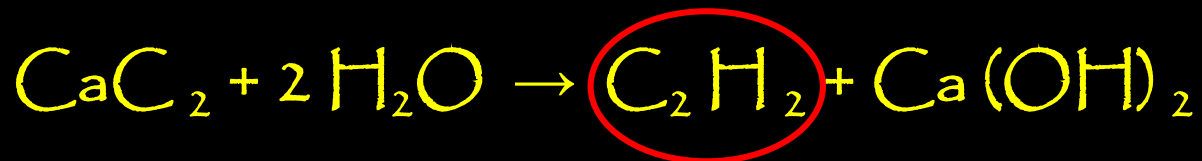
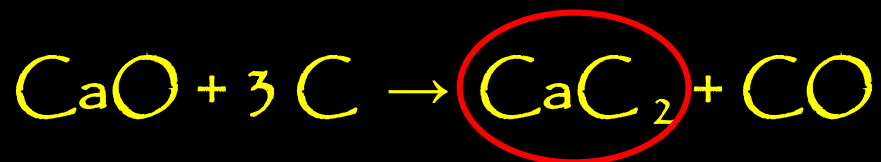
1836 - O acetileno (C_2H_2) é sintetizado por Edmund Davy em Inglaterra.

1862 - Friedrich Wöhler, na Alemanha, descobre o carbeto de cálcio (CaC_2)

1892 - Thomas Leopold Carbide Willson produz carbeto de cálcio num forno de arco elétrico, a partir de uma mistura de cal e coque.



Friedrich Wöhler



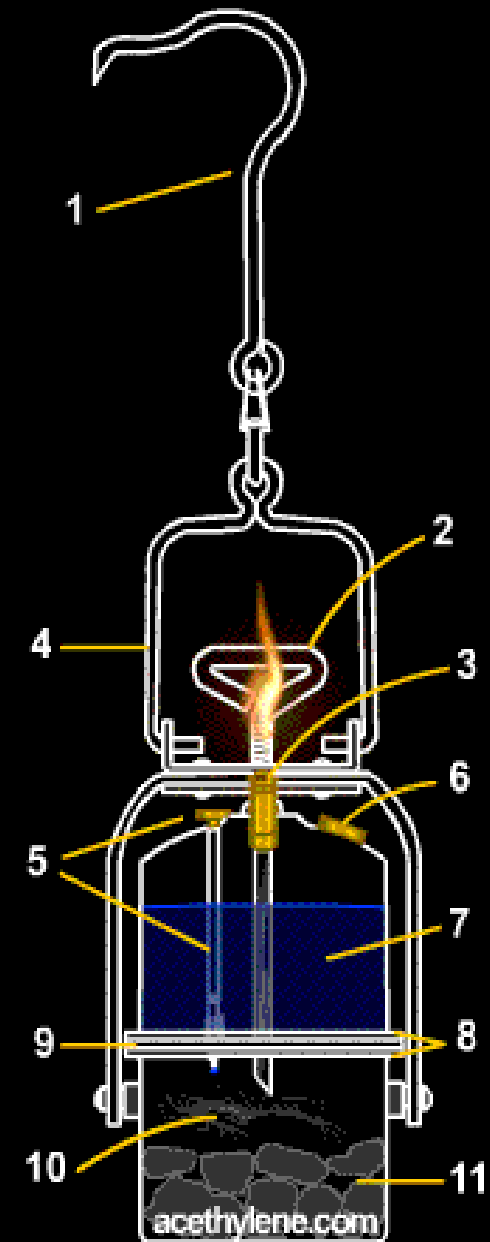
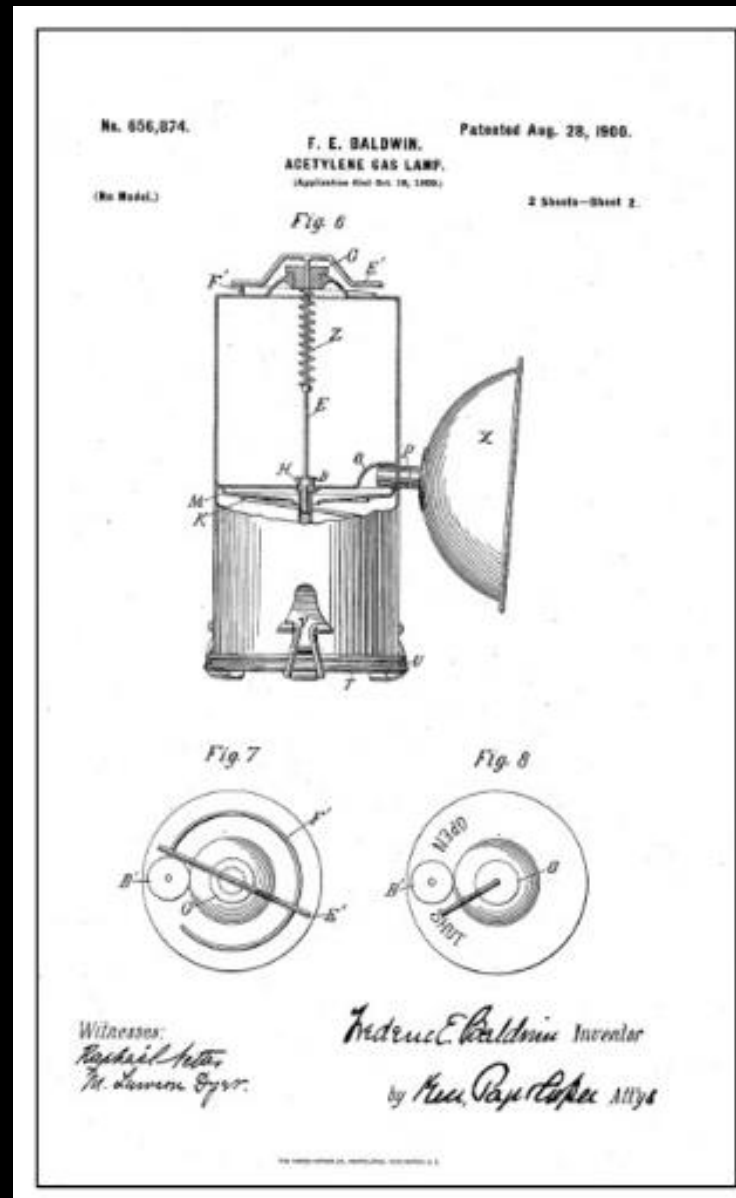
Thomas Willson



Full Moon Acetylene Lamp

1900 - Frederick Baldwin

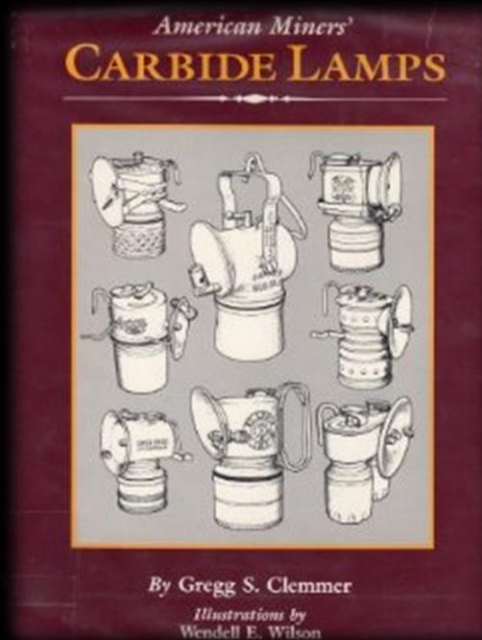
Gasómetro



Gasómetro



Curta Metragem "Gasómetro"
Versão original de 2001, da autoria
de Nelson Fernandes, para
divulgação do Projeto Rio, de
musealização dos espaços da antiga
Lavaria do Cabeço do Pião
Silvares - Fundão



Gasómetro de fabrico
português

 O Maior Gasómetro do Mundo 



O Maior Gasómetro do Mundo
Comunidade

 Gosto  Mensagem 

[Cronologia](#) [Sobre](#) [Fotos](#) [Gostos](#) [Vídeos](#)

 931 pessoas gostam disto

 Convidar amigos para gostarem desta Página

SOBRE 

 O Maior Gasómetro do Mundo

 Estado  Foto/vídeo

 Escreve algo nesta Página...

 **O Maior Gasómetro do Mundo** adicionou 4 fotos novas ao álbum Visita dos Alunos do 6 ano da Escola Campos de Melo 



Mina da
Panasqueira
Covilhã

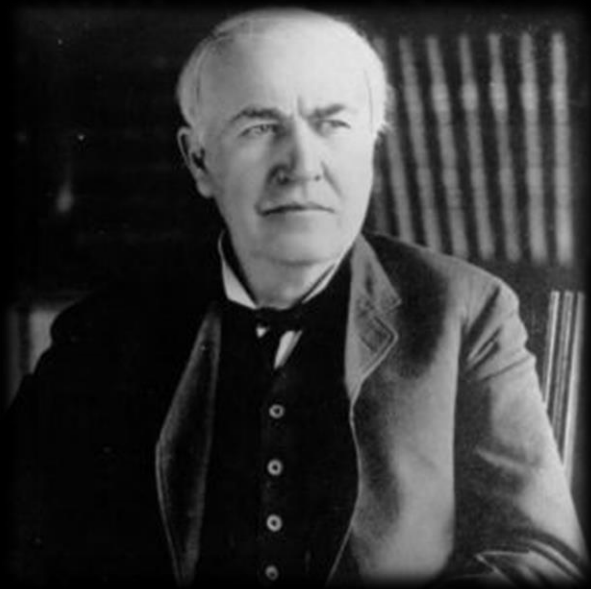
1862 ~ Lanterna elétrica portátil apresentada à Academia de Ciências de Paris por Alphonse Dumas e Camille Benoît



Ruhmkorff Lamp
Júlio Verne
Vinte Mil Léguas Submarinas
1870

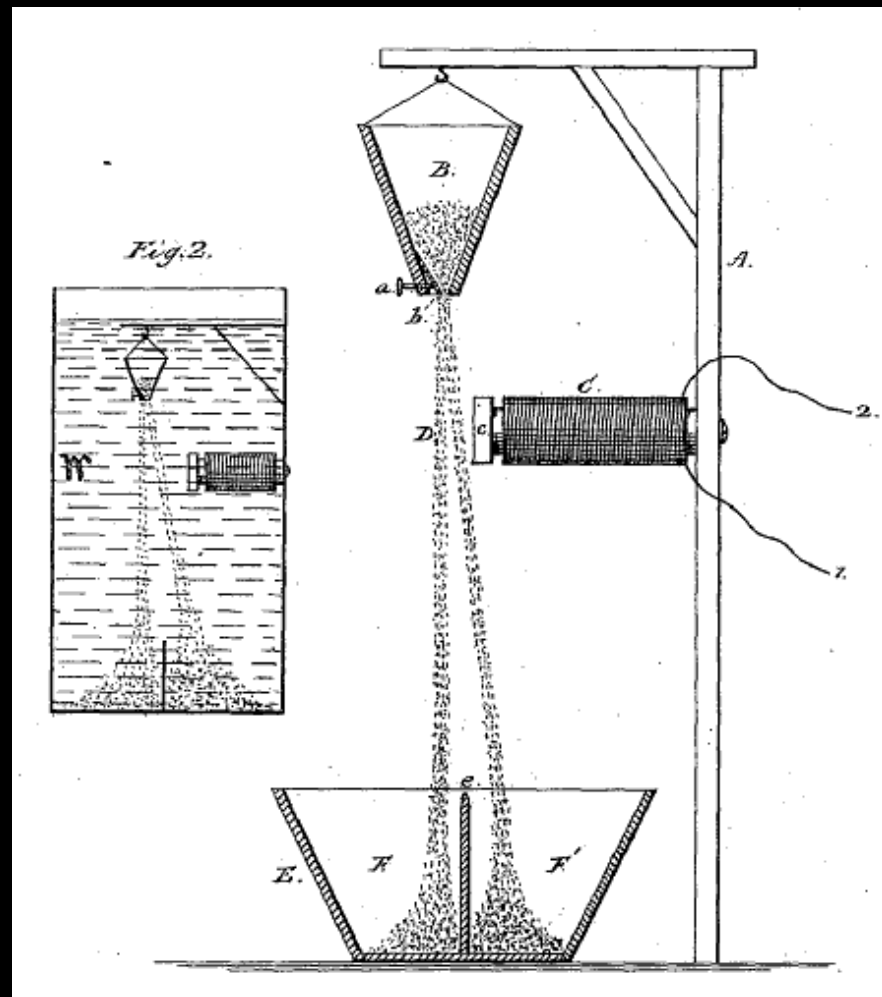


1879/80 - Thomas Alva Edison - Lâmpada elétrica - filamento incandescente.



Thomas Edison

Lanterna de
presença para carro
mineiro



1880
Separação
magnética de
espécies minerais



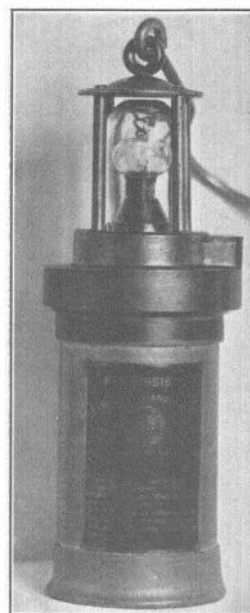


FIGURE 13.—Ceag RMC miners' hand lamp

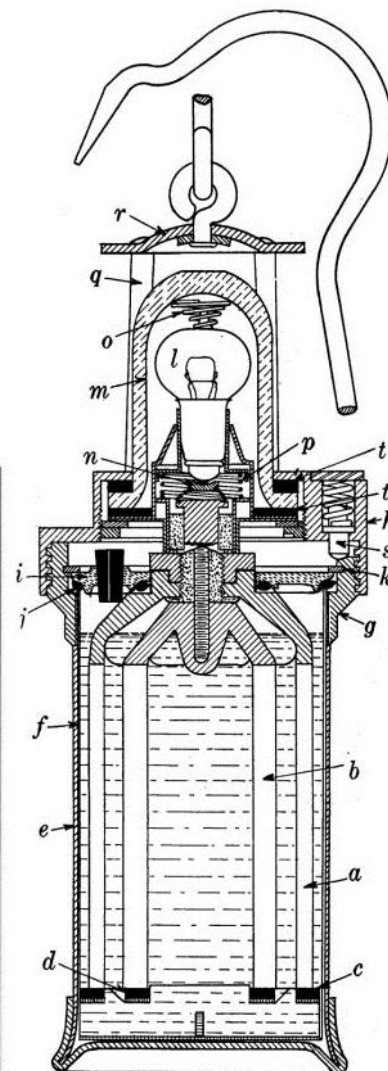
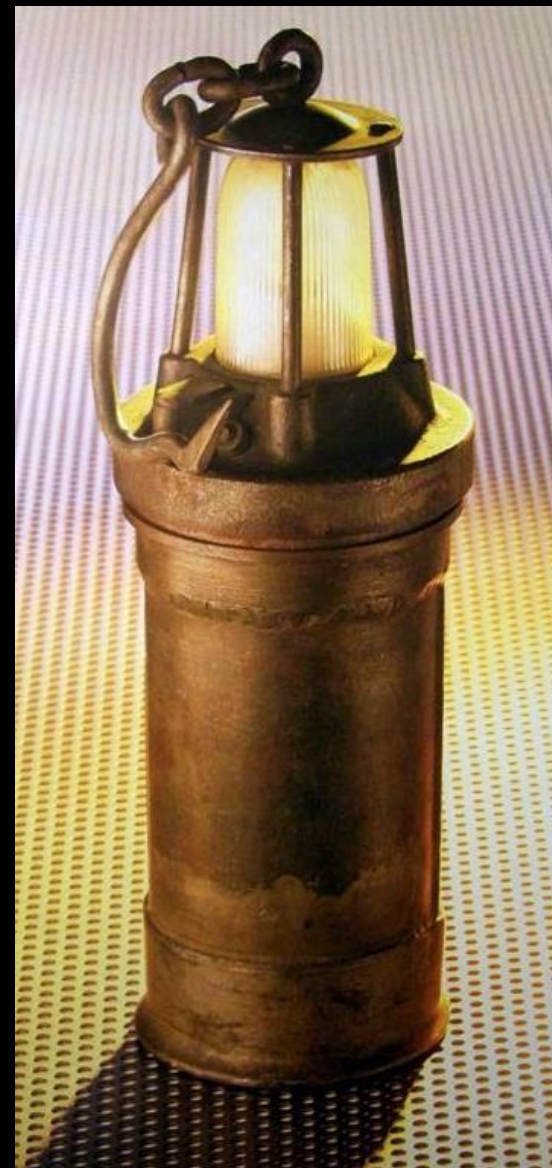


FIGURE 14.—Details of Ceag RMC hand lamp

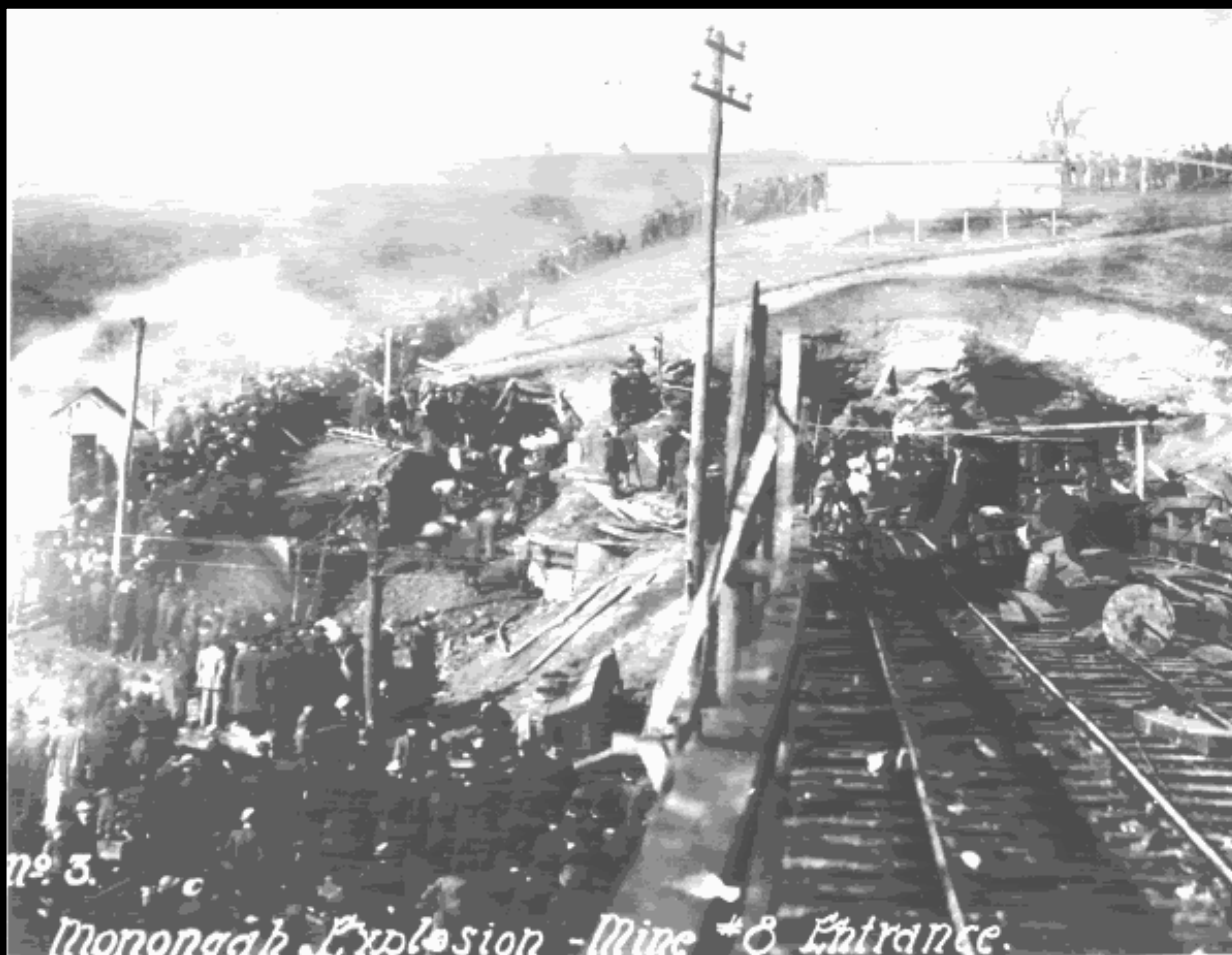


Lanternas elétricas de mão



1907 – Explosão na mina de Carvão de Monongah – Morrem 362 mineiros.

1910 – Congresso Americano cria o United States Bureau of Mines (USBM).

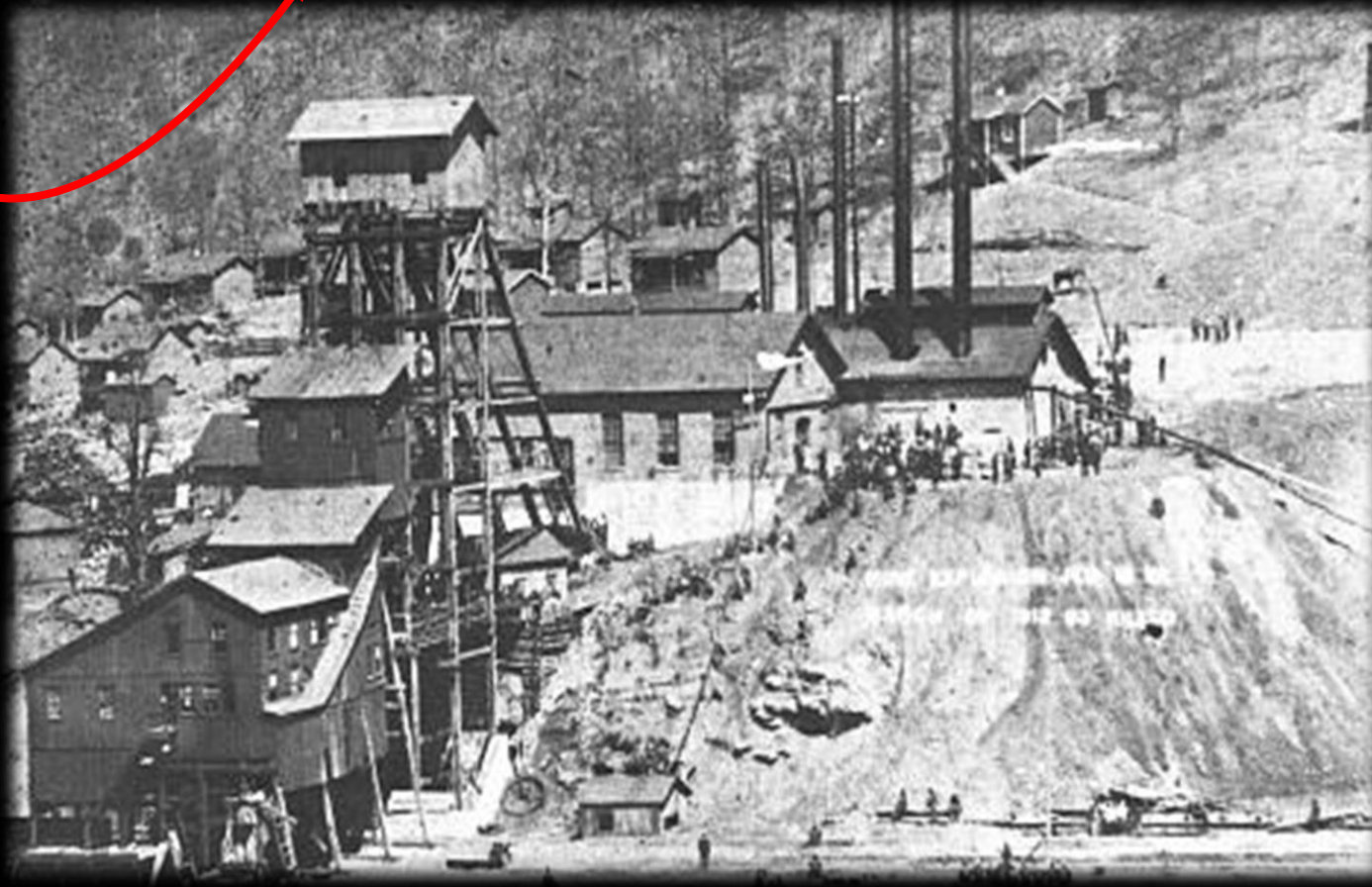


1912 ~ Explosão na mina da Jed Coal and Coke Company ~ Morrem 81 mineiros.



John T Ryan

"If I could spend my life doing what I can to lessen the likelihood of the occurrence of such terrible disasters, I shall feel in the end that my life had been well spent."



George H Deike



1914 - Engenheiros John Ryan e George Deike formam a Mine Safety Appliances Company (MSA)



1917
MSA Aided in Time of War
[MORE INFO](#)

1915
First Product Launched
[MORE INFO](#)

1914
First Products Created
[MORE INFO](#)

1914
MSA was Founded
[MORE INFO](#)

1910 - 1919
[VIEW ALL EVENTS THIS DECADE](#)

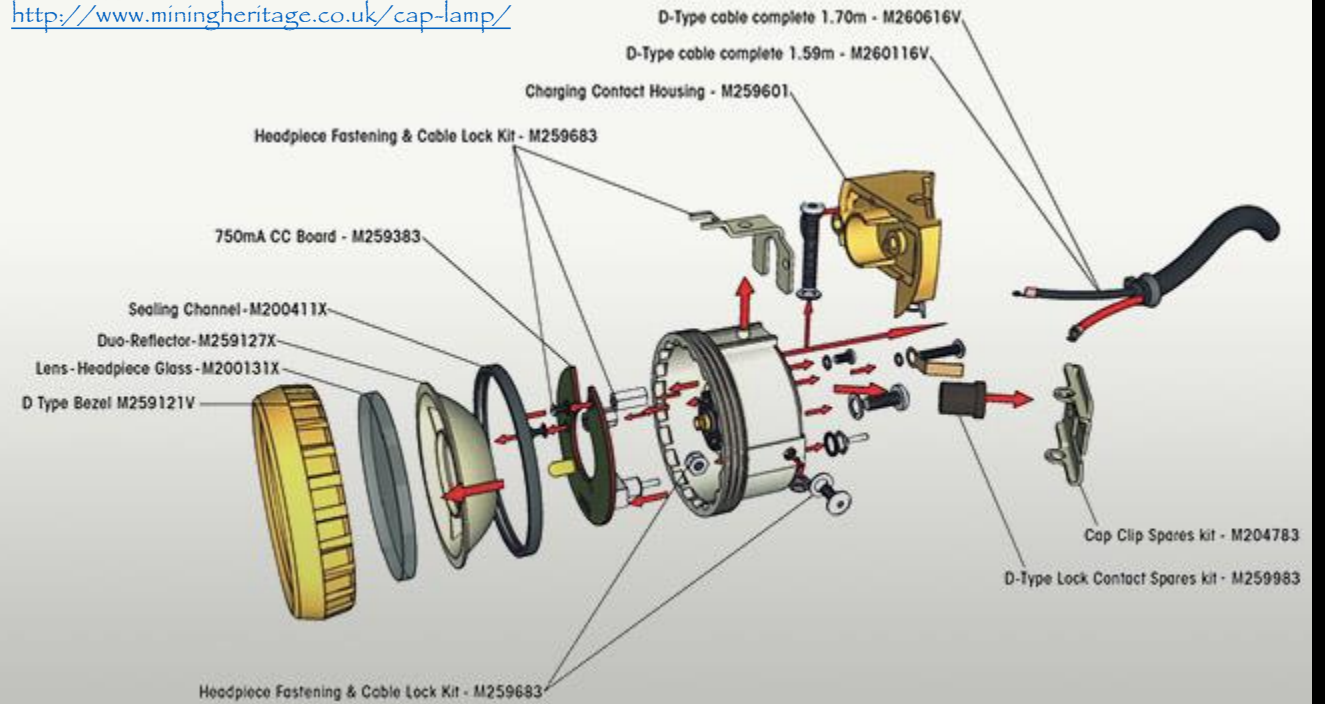
June 14, 1914
MSA was Founded

From day one, Mine Safety Appliances has been a leader in keeping workers safe. Our mission started with founders John Ryan and George Deike on June 14, 1914 when MSA set up a workplace in downtown Pittsburgh, PA. Their first order of business was to enlist Thomas Edison to scale down his alkaline battery to power a flameless cap lamp.

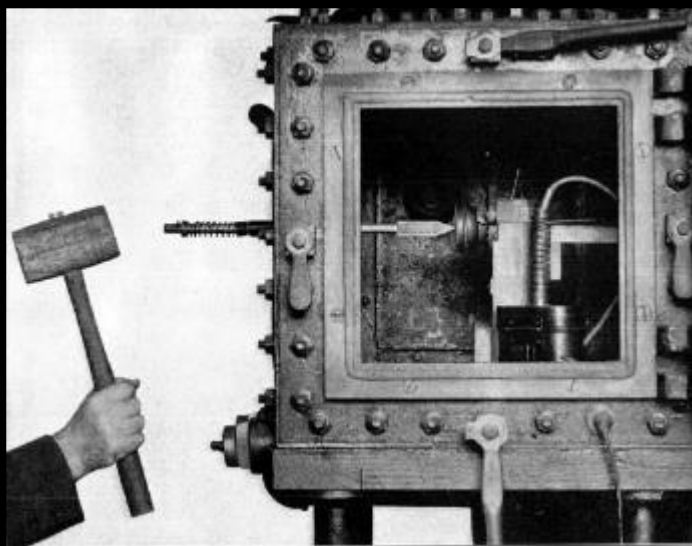




<http://www.miningheritage.co.uk/cap-lamp/>



1914 - Thomas Edison na Mine Safety Appliances Company (MSA)



1915 - Aprovada pelo USBM



ADALIT Torches

Alfa Cap lamps

alfa WL
alfa LDT
SICS



MORE THAN
100 YEARS
OF INNOVATION
AND TECHNOLOGY



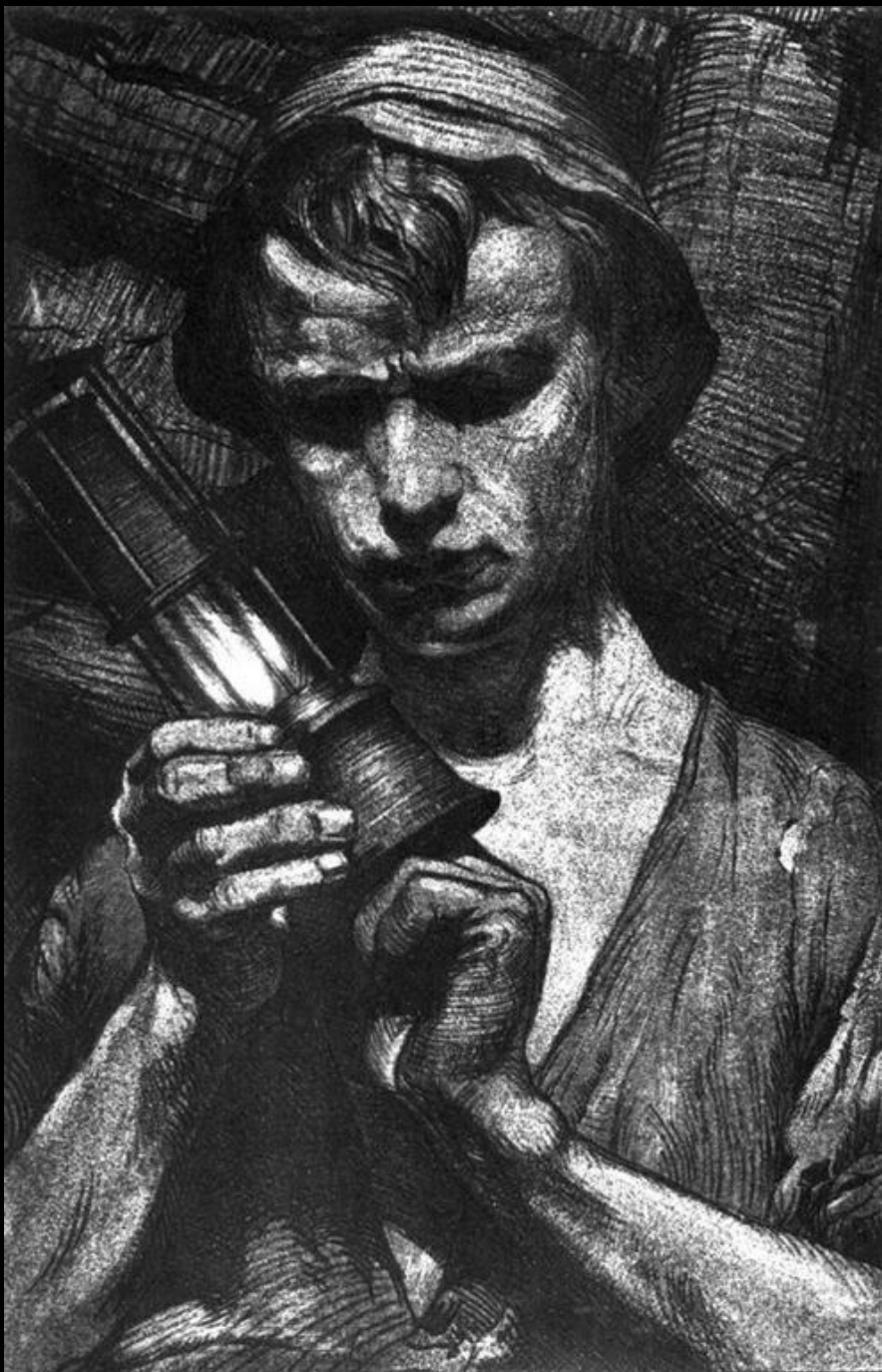
Wireless System for Control and Safety (WSCS)

- User location and presence control in real time, showing the entry/exit times and historical reports
- Emergency warning activated by the user, or automatically when movement absence ("dead man" alarm), sending a signal to the control post and to other lamps around in the working zone
- Identification of the users in the different working sites



Automatic maintenance of the lamps with information and diagnostic of the device state, and monitoring of the most important parameters: battery voltage level, no. Of charge and discharge cycles, and working time of the lighting sources. Display and control via Internet of all the process. Easy and intuitive software can be set up according to the user needs





Cavalete da Mina Sophia-Jacoba

Desenho da autoria de um Mineiro da Mina Sophia-Jacoba
Alemanha